

**Amendments to the Specification**

**Page 5, the first full paragraph, lines 11-18, replace the paragraph with:**

The invention also relates to, as a second embodiment, a process for the decomposition of fluorine compounds comprising steps of decomposing the fluorine compounds, in the presence of water vapor and an inert gas as a diluent gas without addition of oxygen or an oxygen-containing gas; adding oxygen or an oxygen-containing gas to a gas formed by the decomposition; and making the gas in contact with the catalyst the decomposition ~~eff~~of at least one of CO, SO<sub>2</sub>F<sub>2</sub> and N<sub>2</sub>O.

**Page 7, the second full paragraph, lines 10-16, replace the paragraph with:**

According to the first and second embodiments of the invention, fluorine contained in a fluorine compound such as PFC, HFC, SF<sub>6</sub> and NF<sub>3</sub>, is converted to HF, and CO, SO<sub>2</sub>F<sub>2</sub> and N<sub>2</sub>O formed associated with decomposition of the fluorine compounds can also be decomposed. It is considered that CO is oxidized to CO<sub>2</sub>, SO<sub>2</sub>F<sub>2</sub> is decomposed to SO<sub>3</sub> and HF, and N<sub>2</sub>O is decomposed to NO<sub>2</sub> or NO.

**Pages 7-8, the paragraph bridging these pages, page 7, line 19 to page 8, line 1, replace the paragraph with:**

Examples of a-fluorine compounds that generates CO upon hydrolysis include PFC, such as CF<sub>4</sub>, C<sub>2</sub>F<sub>6</sub>, C<sub>3</sub>F<sub>8</sub>, C<sub>4</sub>F<sub>8</sub>, C<sub>5</sub>F<sub>8</sub> and CHF<sub>3</sub>, and HFC, such as C<sub>2</sub>H<sub>2</sub>F<sub>4</sub>.

Examples of a-fluorine compounds that generates  $\text{SO}_2\text{F}_2$  upon hydrolysis include  $\text{SF}_6$ . ~~Examples~~An example of a fluorine compounds that generates  $\text{N}_2\text{O}$  upon hydrolysis ~~include~~is  $\text{NF}_3$ . The invention can be applied to the decomposition process of these fluorine compounds. However, the invention is not limited to these fluorine compounds.

**Page 8, the second full paragraph, lines 12-20, replace the paragraph with:**

Examples of the factors exerting an influence on decomposition of a-fluorine compounds include the concentration of the fluorine compounds in the gas to be processed, the amount of the moisture, the reaction temperature, the material of the catalyst, the preparation method of the catalyst and the space velocity. The space velocity is a value obtained by dividing the gas flow amount (ml/h) upon passing the gas to be processed through the catalyst by the catalyst amount (ml).

**Page 13, the first full paragraph, lines 6-11, replace the paragraph with:**

A further embodiment of the apparatus for the decomposition of fluorine compounds according to the invention is an apparatus for the decomposition of ~~and of~~

and removing  $\text{SO}_2\text{F}_2$  from a gas containing  $\text{SO}_2\text{F}_2$  comprising a reactor having an  $\text{SO}_2\text{F}_2$  decomposition catalyst charged therein; and means for adding water and oxygen to the gas supplied to the reactor.

**Page 23, the first full paragraph, lines 5-14, replace the paragraph with:**

A fluorine compounds containing  $\text{C}_4\text{F}_8$  was decomposed by using the apparatus shown in Fig. 1 while the material of the harmful component removing catalyst 3 was changed. The fluorine compounds decomposition catalyst 2 was the same as that used in Example 1. In the gas to be processed, the  $\text{C}_4\text{F}_8$  concentration was 0.5 vol%, the oxygen concentration was 4 vol%, and the water vapor concentration was 25 vol%. The reaction temperature was  $700^\circ\text{C}$ . The space velocity was 1,000  $\text{h}^{-1}$  at the fluorine compounds decomposition catalyst 2 and 3,000  $\text{h}^{-1}$  at the harmful component removing catalyst 3.

**Pages 30-31, the paragraph bridging these pages, page 30, line 5 to page 31, line 4, replace the paragraph with:**

A decomposition treatment of a-fluorine compounds containing  $\text{C}_2\text{F}_6$  was conducted by using the apparatus shown in Fig. 1, in which an Al-Ti catalyst containing aluminum and titanium as an oxide as the fluorine compounds decomposition catalyst 2 and a Pd and La-carried alumina catalyst as the harmful

component removing catalyst 3. The experiment was conducted for both the cases where the harmful component removing catalyst 3 was used and was not used. The material, the composition and the preparation method of the harmful component removing catalyst 3 were the same as in Example 8. The conditions, such as concentrations of the gas to be processed and the reaction temperature at the inlet of the reactor 1, were the same as in Example 8. The Al-Ti catalyst was prepared in the following manner. Commercially available boehmite powder was dried by calcinated at a temperature of 120°C for 1 hour. 248.4 g of a titanium sulfate solution containing 30 wt% of titanium was mixed and kneaded with 200 g of the powder while pure water was added thereto. After mixing and kneading, the mixture was dried at at a temperature of from 250 to 300°C for about 5 hours and at a temperature of 700°C for 2 hours. The thus resulting powder was put in a metallic mold and subjected to compression molding at a pressure of 500 kgf/cm<sup>2</sup>. The molded article was pulverized and classified to obtain a particle diameter of from 0.5 to 1 mm. A catalyst containing 90 mol% of Al and 10 mol% of Ti was thus obtained.

**Pages 33-35, the paragraph bridging these pages, page 33, line 12 to page 35, line 2, replace the paragraph with:**

The gas having been treated in the pre-treatment tower 99 is fed to a pre-heater 5 for heating. The air 15 and water 20 are also fed to the pre-heater 5. It is preferred that the water 20 is fed to the pre-heater after removing impurities, such as

calcium, contained in the water by passing through an ion exchange resin 16. The concentration of the fluorine compounds is adjusted to a range of about from 0.1 to 5 vol% at the pre-heater 5. The amount of water is adjusted to a range of about from 5 to 75 times the molar number of the fluorine compounds. The amount of the air is adjusted to make the oxygen concentration be a range of about from 0.2 to 15 vol%. The gas to be processed having the concentrations thus adjusted is heated to a temperature of from 650 to 850°C by using a heater 6, such as an electric furnace, and supplied to a reactor 1. A fluorine compounds decomposition catalyst 2 and a harmful component removing catalyst 3 are charged in the reactor 1. It is preferred that the reactor 1 is also heated to a temperature of about from 650 to 850°C by a heater 4, such as an electric furnace. The gas to be treated supplied to the reactor 1 is firstly made in contact with the fluorine compounds decomposition catalyst 2, whereby the fluorine compounds ~~is~~are reacted with water to decompose the fluorine compounds to hydrogen fluoride and carbon monoxide or  $\text{SO}_2\text{F}_2$ . Thereafter, the gas is made in contact with the harmful component removing catalyst 3, whereby carbon monoxide, carbon dioxide,  $\text{SO}_3$  and  $\text{SO}_2\text{F}_2$  are decomposed. The gas emitted from the reactor 1 is supplied to a cooling chamber 17 to cool, for example, by spraying water from a spray nozzle 18. The gas emitted from the cooling chamber 17 is supplied to a gas scrubbing tower 7 for scrubbing with water sprayed from a spray nozzle 13, whereby hydrogen fluoride and other water soluble components are removed. It is preferred that a filler 19 formed from plastic particles

is filled in the gas scrubbing tower 7 to ensure contact of the gas with water. The water absorbing hydrogen fluoride and other water soluble components in the gas scrubbing tower 7 is discharged from the gas scrubbing tower 7 by sucking with a pump 21, followed by treating, for example, in a waste water treatment apparatus. The gas, from which hydrogen fluoride and other water soluble components are removed in the gas scrubbing tower 7, is discharged from the gas scrubbing tower 7 by sucking with a blower 22.

**Page 35, the first full paragraph, lines 3-11, replace the paragraph with:**

Fig. 10 shows another example according to the invention. The point of the apparatus shown in Fig. 10 that is different from the apparatus shown in Fig. 9 is that, in Fig. 10, the air 15 is added to the gas supplied to the harmful component removing catalyst 3 in the reactor 1. It is also possible by the manner of this embodiment that the fluorine compound is decomposed, and CO or SO<sub>2</sub>F<sub>2</sub> formed by the decomposition of the fluorine compounds can also be removed as similar to the embodiment shown in Fig. 9. The gas emitted from the reactor 1 is supplied to a cooling chamber 17 to cool, for example, by spraying water from a spray nozzle 18.